

AMENDMENTS

In the Claims

Please cancel claims 24-35 without prejudice.

No claims have been amended.

Claims 1-23 and 36-47 are pending and are listed following:

1. (original) An antenna element, comprising:

a front plate that includes slots configured for wireless communication signal transfer;

a dielectric configured to regulate a cutoff wavelength of the antenna element;

a channel guide coupled to the front plate and configured to confine the dielectric in a position that aligns the dielectric with the slots in the front plate; and

a back plate coupled to the channel guide and configured to enclose the dielectric within the channel guide to form an enclosed dielectric channel.

2. (original) An antenna element as recited in claim 1, wherein the dielectric is formed from a polystyrene material.

3. (original) An antenna element as recited in claim 1, wherein the dielectric includes a center conductive section and one or more cross-sections.

1 **4. (original)** An antenna element as recited in claim 1, wherein the
2 dielectric includes a center conductive section and one or more cross-sections
3 transverse to the center conductive section.

4
5 **5. (original)** An antenna element as recited in claim 1, wherein:
6 the dielectric includes a center conductive section and one or more cross-
7 sections perpendicular to the center conductive section;
8 the center conductive section extends lengthwise within the enclosed
9 dielectric channel; and
10 the one or more cross-sections are spaced within the enclosed dielectric
11 channel to align with the slots in the front plate.

12
13 **6. (original)** An antenna element as recited in claim 1, wherein:
14 the dielectric includes a center conductive section and one or more cross-
15 sections perpendicular to the center conductive section;
16 the center conductive section extends lengthwise within the enclosed
17 dielectric channel between a first row of the slots and a second row of the slots;
18 and
19 the one or more cross-sections are spaced within the enclosed dielectric
20 channel to align with the slots in the front plate.

1 7. (original) An antenna element as recited in claim 1, wherein the
2 channel guide includes at least a first sidewall and a second sidewall, and wherein
3 the first sidewall and the second sidewall are each configured to prevent
4 communication signal interference.

5
6 8. (original) An antenna element as recited in claim 1, wherein the
7 front plate further includes the slots spaced apart a distance that is substantially
8 equivalent to an antenna element wavelength divided by two.

9
10 9. (original) An antenna element as recited in claim 1, wherein the
11 front plate further includes a first row of one or more of the slots and a second row
12 of one or more of the slots.

13
14 10. (original) An antenna element as recited in claim 1, wherein the
15 front plate further includes a first row of one or more of the slots and a second row
16 of one or more of the slots, and wherein the slots in each of the first row and the
17 second row are spaced apart a distance that is substantially equivalent to an
18 antenna element wavelength divided by two.

19
20 11. (original) An antenna element as recited in claim 1, wherein the
21 front plate further includes a first row of one or more of the slots and a second row
22 of one or more of the slots, and wherein the slots in the first row are offset from
23 the slots in the second row.

1 **12. (original)** An antenna element as recited in claim 1, wherein:
2 the front plate further includes a first row of one or more of the slots and a
3 second row of one or more of the slots; and
4 the slots in the first row are offset from the slots in the second row in a
5 direction parallel to the first row and a distance that is substantially a length of a
6 slot.

7
8 **13. (original)** An antenna element as recited in claim 1, wherein the
9 slots in the front plate are substantially rectangular.

10
11 **14. (original)** An antenna element as recited in claim 1, wherein the
12 slots in the front plate are notched slots.

13
14 **15. (original)** An antenna element as recited in claim 1, wherein the
15 slots in the front plate are offset slots.

16
17 **16. (original)** An antenna element as recited in claim 1, wherein the
18 slots in the front plate are offset slots, and wherein an offset slot is substantially
19 rectangular having an offset section formed about a transverse center of the offset
20 slot.

21
22 **17. (original)** An antenna element as recited in claim 1, further
23 comprising a connection system configured to communicatively couple the
24 antenna element to an antenna system component.
25

1 **18. (original)** An antenna element as recited in claim 1, further
2 comprising:

3 an RF connection system configured to communicatively couple the
4 antenna element to an antenna system component; and

5 a fastener component configured to communicatively couple the dielectric
6 to the RF connection system without an RF connector.

7
8 **19. (original)** An antenna assembly comprising one or more antenna
9 elements as recited in claim 1.

10
11 **20. (original)** A waveguide enclosing a solid dielectric.

12
13 **21. (original)** A waveguide enclosing a solid dielectric as recited in
14 claim 20, wherein:

15 the solid dielectric includes a center conductive section and one or more
16 cross-sections perpendicular to the center conductive section;

17 the center conductive section extends lengthwise within the enclosed
18 waveguide; and

19 the one or more cross-sections are spaced within the enclosed waveguide to
20 align with communication signal transfer slots in the enclosed waveguide.

1 **22. (original)** A waveguide enclosing a solid dielectric as recited in
2 claim 20, wherein the enclosed waveguide includes:

3 a front plate having communication signal transfer slots;

4 a channel guide coupled to the front plate and configured to confine the
5 solid dielectric in a position that aligns the solid dielectric with the communication
6 signal transfer slots; and

7 a back plate coupled to the channel guide to enclose the solid dielectric
8 within the channel guide.

9
10 **23. (original)** An antenna assembly comprising one or more
11 waveguides enclosing a solid dielectric as recited in claim 20.

12
13 **24. (canceled)** An antenna system, comprising:

14 an antenna assembly of one or more antenna elements, each antenna
15 element including a solid dielectric enclosed in a conductive channel having slots
16 configured for wireless communication signal transfer;

17 one or more antenna boards each configured to interface communication
18 signals with the antenna assembly; and

19 a beam-forming network configured to set-up a phasing of the antenna
20 assembly.

1 25. (canceled) An antenna system as recited in claim 24, wherein:
2 the one or more antenna elements of the antenna assembly further include a
3 first row of the slots and a second row of the slots;

4 the slots in each of the first row and the second row are spaced apart a
5 distance that is substantially equivalent to an antenna element wavelength divided
6 by two; and

7 the slots in the first row are offset from the slots in the second row in a
8 direction parallel to the first row and a distance that is substantially a length of a
9 slot.

10
11 26. (canceled) An antenna system as recited in claim 24, wherein the
12 one or more antenna elements of the antenna assembly include the slots that are
13 substantially rectangular.

14
15 27. (canceled) An antenna system as recited in claim 24, wherein the
16 one or more antenna elements of the antenna assembly include the slots that are
17 offset slots.

18
19 28. (canceled) An antenna system as recited in claim 24, wherein the
20 one or more antenna elements of the antenna assembly include the slots that are
21 offset slots, and wherein an offset slot has an offset section formed about a
22 transverse center of the offset slot.

23

24

25

1 **29. (canceled)** An antenna system as recited in claim 24, further
2 comprising one or more connection systems each corresponding to a different one
3 of the one or more antenna elements, each connection system configured to
4 communicatively couple a corresponding antenna element to an antenna board.

5
6 **30. (canceled)** An antenna system as recited in claim 24, further
7 comprising:

8 one or more RF connection systems each corresponding to a different one
9 of the one or more antenna boards, each RF connection system configured to
10 communicatively couple a corresponding antenna element to an antenna board;
11 and

12 one or more fastener components each configured to communicatively
13 couple the solid dielectric of the corresponding antenna element to the RF
14 connection system without an RF connector.

15
16 **31. (canceled)** A wireless communication system comprising one or
17 more antenna systems as recited in claim 24.

1 **32. (canceled)** A wireless communication system, comprising:
2 a communication network;
3 a server computing device configured to administrate the wireless
4 communication system;
5 an antenna system communicatively coupled to the computing device via
6 the communication network, the antenna system configured to transmit and
7 receive wireless communication signals throughout a region with an antenna
8 assembly having antenna elements that each include a solid dielectric enclosed in a
9 conductive channel having slots configured for communication signal transfer.

10
11 **33. (canceled)** A wireless communication system as recited in claim
12 32, further comprising one or more client devices configured to receive data from
13 the server computing device, the data transmitted as the wireless communication
14 signals with the antenna system.

15
16 **34. (canceled)** A wireless communication system as recited in claim
17 32, further comprising one or more client devices each configured to communicate
18 data to the server computing device, the data being communicated as the wireless
19 communication signals via the antenna system.

1 **35. (canceled)** A wireless communication system as recited in claim
2 32, further comprising:

3 a first client device configured to transmit and receive the wireless
4 communication signals; and

5 a second client device configured to communicate data to the first client
6 device, the data being communicated as the wireless communication signals via
7 the antenna system.

8
9 **36. (original)** A method, comprising:

10 forming a front plate with slots configured to wirelessly transfer
11 communication signals;

12 forming a channel guide;

13 forming a back plate; and

14 attaching the front plate, the channel guide, and the back plate together to
15 form a conductive channel that encloses a solid dielectric.

16
17 **37. (original)** A method as recited in claim 36, further comprising
18 forming the solid dielectric to regulate a cutoff wavelength of the conductive
19 channel.

20
21 **38. (original)** A method as recited in claim 36, further comprising
22 forming the solid dielectric with a center conductive section and one or more
23 transverse cross-sections.

1 **39. (original)** A method as recited in claim 36, further comprising
2 forming the solid dielectric with a center conductive section and one or more
3 cross-sections perpendicular to the center conductive section.

4
5 **40. (original)** A method as recited in claim 36, further comprising:
6 forming the solid dielectric with a center conductive section and one or
7 more cross-sections perpendicular to the center conductive section; and
8 positioning the solid dielectric such that the center conductive section
9 extends lengthwise within the conductive channel and the one or more cross-
10 sections are spaced to align with the slots in the front plate.

11
12 **41. (original)** A method as recited in claim 36, wherein forming the
13 channel guide includes forming the channel guide with at least a first sidewall and
14 a second sidewall, and wherein the first sidewall and the second sidewall are each
15 configured to prevent communication signal interference with an adjacent
16 conductive channel.

17
18 **42. (original)** A method as recited in claim 36, wherein forming the
19 front plate includes forming the front plate with a first row of one or more of the
20 slots and a second row of one or more of the slots.

1 **43. (original)** A method as recited in claim 36, wherein forming the
2 front plate includes forming the front plate with a first row of one or more of the
3 slots and a second row of one or more of the slots, and wherein the slots in the first
4 row are offset from the slots in the second row.

5
6 **44. (original)** A method as recited in claim 36, wherein forming the
7 front plate includes forming the front plate with the slots that are substantially
8 rectangular.

9
10 **45. (original)** A method as recited in claim 36, wherein forming the
11 front plate includes forming the front plate with the slots that are offset slots.

12
13 **46. (original)** A method as recited in claim 36, wherein forming the
14 front plate includes forming the front plate with the slots that are offset slots, and
15 wherein each offset slot has an offset section formed about a transverse center of
16 the offset slot.

17
18 **47. (original)** A method as recited in claim 36, further comprising
19 coupling the solid dielectric to an RF conductive trace of an RF connection system
20 without using an RF connector.